PART III

PHYSICAL DESCRIPTION

Physical Regions of Washington

On the basis of surface features, Washington may be divided into eight general regions. Agricultural settlement is influenced by factors of topography, climate, soil, forest vegetation, and water resources distinctive to each of the physiographic regions. Each has become a different type of farming area as settlers have learned to adapt crops and livestock to the conditions, or have improved limitations through drainage or irrigation.

Coastal Plains

A narrow, sandy plain with shallow bays, tidal flats, stream deltas and low headlands lies between the coastline and the Coast Range. It extends from the Columbia River mouth almost to Cape Flattery, being widest and lowest in the Grays Harbor and Willapa Bay districts. The climate is mild and damp with a long growing season, but it is too cool, cloudy and wet for most crops. Originally, this area was covered with heavy forests but much of it is now covered with woodlands. Lumbering and manufacture of wood products is the main industry. Farming is largely livestock and dairying on low uplands and drained areas in the lower Chehalis River Valley. Cranberry growing is important and well-adapted to numerous, boggy areas in the Grays Harbor and Willapa Bay sections. The shallow bays are also used for oyster culture. Fishing is common in the rivers and coastal banks.

Coast Range

The Coast Range is an uplifted area of sedimentary and metamorphic rocks divided into the Olympic Mountains and the Willapa Hills. The Olympics tower to nearly 8,000 feet in a dome-like structure, carved deeply by rivers. These mountains have the heaviest precipitation in the state. Snowfields and heavy forest cover the mountains. Most of the wilderness area is within the Olympic National Forest and Olympic National Park, being managed for recreation, wildlife and timber. Farm settlement is limited to some foothill river plains and coastal terraces such as the Dungeness and Port Angeles districts along the Strait of Juan de Fuca. Here in the lee of the mountains, rainfall is moderate and irrigation is practiced by some livestock farmers. The Willapa Hill country is wet, heavily forested and carved into numerous narrow valleys. Logging is the main industry, combined with livestock farming in the upper Chehalis River Valley and along the banks of the Columbia River. Wet climate, hilly topography and the difficulty of clearing stump land retards agriculture.

Willamette-Puget Sound Lowland

A broad lowland, described as a trough or valley, lies between the Coast Range and the Cascade Mountains. The northern part is the Puget Sound Lowland which has been glaciated and is occupied by the sea in the lowest sections. The continental glacier reached slightly south of Olympia. Under a warming climate it melted and geologists believe it receded about 25,000 years ago, leaving an infertile plain of moraines and outwash gravels, sands and clays known today as the Puget Glacial Drift Plain. Its rolling surface has numerous lakes and bogs.

Most of the major cities--Seattle, Tacoma, Everett, Bellingham and Olympia--have been built on moraines bordering the Sound. Rivers such as the Nooksack, Skagit, Snoqualmie, White and Puyallup have built up deltas and flood plains over the older gravelly plains. These narrow valleys are more fertile than the older glacial plains and support numerous small dairy, vegetable and berry farms. Most of the gravelly areas are wooded with a second-growth forest and are used for pastures. In the southern part of the Willamette-Puget Sound Lowland, there are two large valleys--the Cowlitz and Chehalis. They drain a low, hilly area with several flat prairies and bottom lands.

Agriculture is handicapped by poor drainage and flooding of the river deltas and plains, by heavy winter rainfall, by cloudy but dry summers, by coarse, gravelly upland soils and by densely wooded land which is costly to clear. Advantages are mild climate and a location close to major markets for farm products such as milk, poultry and vegetables.

Cascade Mountains

The Cascades are a wide and high topographic and climatic barrier which separates western and eastern Washington. The range is made up of sedimentary, igneous and metamorphic rocks which have been carved by glaciers and streams. High, isolated volcanic cones of lava such as Mt. Adams (12,307 feet), Mt. Rainier (14,408 feet), and Mt. Baker (10,791 feet), appear upon the older Cascade rocks. The Cascade crest varies between 10,000 and 3,000 feet and is higher and more rugged in northern Washington. Roads and railroads have been built across its lower passes in central and southern Washington. The Columbia River has cut a deep gorge and the lowest pass through the barrier. The western slope is wet and heavily forested with Douglas fir. The eastern slope is drier with a less-dense pine forest. Nearly all classified as forest land, most of the area is in Federal ownership in five national forests and Mount Rainier National Park. Tree fruit farming in the eastern slope valleys of Wenatchee, Chelan, Methow, Naches and the Columbia Gorge is most important. Sheep and cattle summer grazing on alpine grasslands is another use. Deep western slope valley bottoms such as the Skagit, Snoqualmie, Nisqually, Cowlitz and Lewis also contain livestock farms. The area is vitally important as a source of water for irrigation and city drinking water and as a source of timber. Steep terrain, wet climate, short growing seasons and heavy forest vegetation are main handicaps for agriculture.

Columbia Basin

A low plateau of old lava rocks covered with stream and wind-deposited soils extends in a series of plains, ridges, coulees and hills from the Cascades to the eastern Washington border. The area is basin-like in structure, being higher around its margins and sloping inward to low and level central plains. It has been sharply eroded by the Columbia River and its interior tributaries, the Snake, Yakima, Palouse and Spokane Rivers. The basin has sub-areas created by crustal movements and erosion.

A. The Yakima Folds are a series of hilly ridges extending from the Cascades eastward into the lower part of the basin. The Yakima and Columbia Rivers have cut gaps through the ridges, and built up plains in the troughs between them. The rich, alluvial plain of the Yakima River is an important irrigated valley.

B. The Waterville Plateau is a tableland of thin soils overlaying basaltic rock at an elevation of 2,500 to 3,000 feet. It has gorges cut by the Columbia River and ancient glacial outwash streams once flowing in Moses and Grand Coulees. It is too high for irrigation and is used for dryland grain and livestock farming. The high plain is often called the Big Bend Country.

C. The Channelled Scablands is a belt of dry terrain carved by ice-age rivers into a series of coulees. Bare rock is exposed in the coulees. Small plateaus between the old river channels have thin soils used for dryland farming. The Grand Coulee of this region has been developed into a major irrigation reservoir.

D. The Palouse Hills consist of fertile deposits of wind-blown soils overlaying basaltic lava flows. After being deposited in large dunes, the formation was reshaped by streams into an intricate pattern of low, rounded hills which are tilled for wheat, barley and legumes. The hills receive 16 to 25 inches of rainfall annually and are composed of deep, porous and fertile soils. It is one of the richest farming areas of the Pacific Northwest.

E. The Central Plains are low and relatively level expanses of soil, deposited by old streams crossing the Channelled Scablands and later by the flooding of the Yakima, Columbia, Snake and Walla Walla Rivers. Climate is desert-like (6-12 inches of precipitation per year). The lower lands of the area, the Quincy and Pasco Basins and the Walla Walla Valley, are irrigated. The Quincy Basin is a new irrigation area watered by Grand Coulee Dam.

Agricultural handicaps in Columbia Basin regions are mainly found in its dry, continental climate. Large irrigation systems built since 1900 have overcome much of the need for water on rich valley and basin soils. Dryland farming in higher areas is practiced widely, although occasional variations in rainfall, lack of snowfall, winterkill, water and wind erosion inflict damage to field crops and to livestock ranges.

Okanogan Highlands

A portion of the Rocky Mountains, consisting of well-eroded, old granites, lavas and sedimentary rocks, extends across north-central Washington. These are the Okanogan Highlands, the state's richest mineral area. Summit levels reach 4,000 to 5,000 feet with peaks exceeding 7,000 feet. Prominent north-south valleys are occupied by irrigated tree fruit and livestock farms. These are the Okanogan, Sanpoil, Kettle and Colville Valleys. The Columbia River Gorge through the Okanogan Highlands is occupied by the large man-made lake behind Grand Coulee Dam--Roosevelt Lake. Higher and wetter portions are forested with pine and larch, and are managed for timber and for livestock ranges by the United States Forest Service and the Bureau of Indian Affairs. Cold winter temperatures, short growing seasons, dry valley climates and remoteness from markets are farming handicaps.

Selkirk Mountains

The Selkirks, a range of the Rocky Mountain system, extend into the northeast corner of Washington. The rocks are old, mineralized granites and metamorphics reaching elevations of over 7,000 feet. The Pend Oreille River Valley at the base of the Selkirks is an agricultural area of narrow bottomlands settled by livestock

farmers. Nearly all of the uplands are in Kaniksu National Forest. While climate is cool and growing seasons are short, the Pend Oreille Valley has an advantage of being relatively in close proximity to the Spokane metropolitan market area.

Blue Mountains

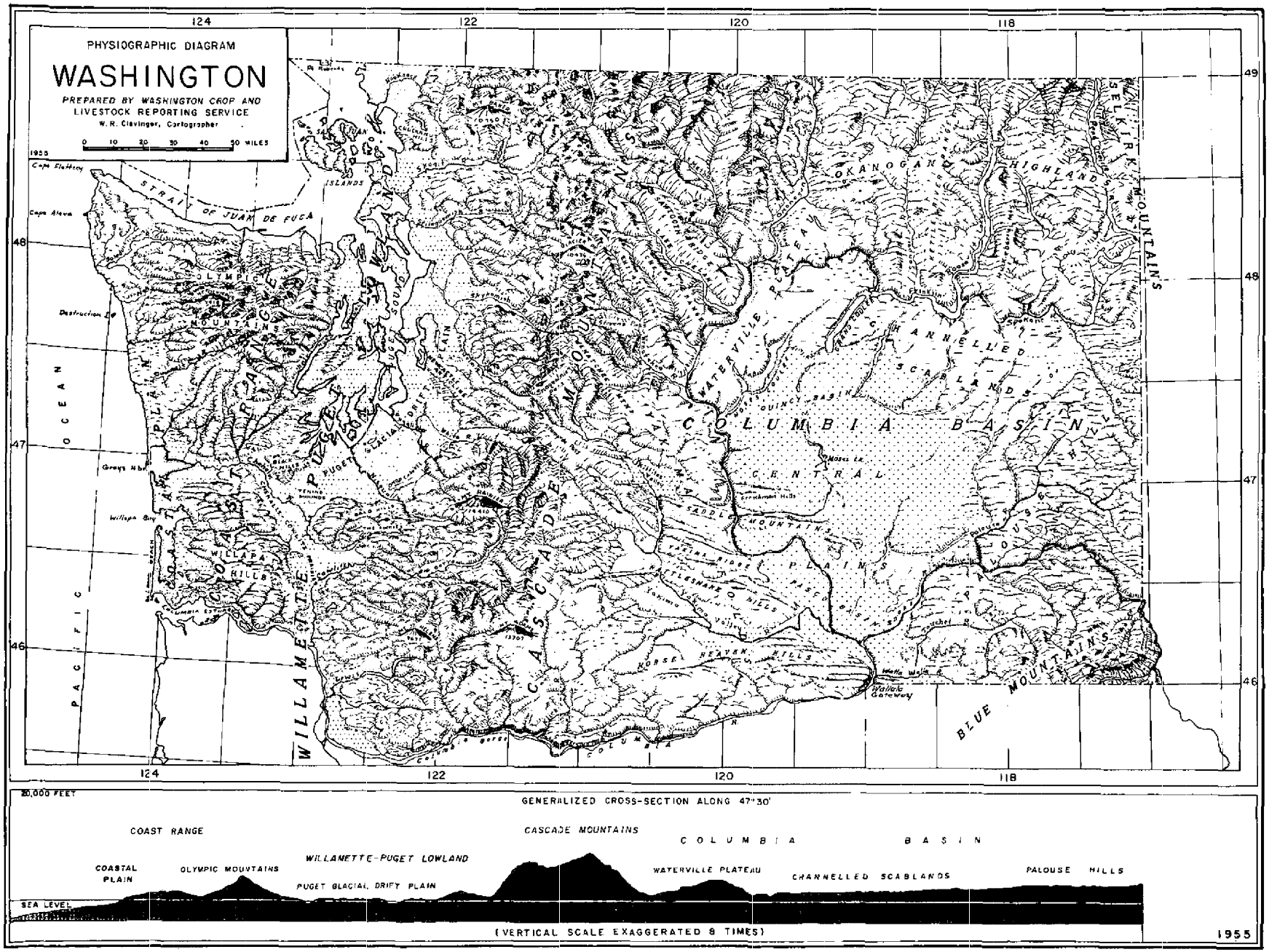
The Blue Mountains are an uplifted and eroded plateau extending into the southeastern corner of Washington. The strata are mainly ancient crystalline rocks which contain some minerals. The highest point of the mountains in the Washington section is Diamond Peak (6,401 feet) located on the divide between the Grande Ronde, Tucannon and Touchet Rivers. These rivers, and the Walla Walla River, have cut valleys into the plateau. Extensive pine forest and grassland areas are in the highlands within Umatilla National Forest, where rainfall is 30 to 40 inches. The Snake River has cut a deep valley and gorge across the lower parts of the mountains. The area is well developed agriculturally around its northern foothills where wind-blown soils are deep and irrigation systems are used. The Walla Walla and Tucannon Valleys are rich grain, legume and livestock areas of irrigation and dry farming. Grazing is an important use of the highlands by livestock ranchers in the upper valleys.

Topography of Ferry County

Ferry County is situated entirely within the Okanogan Highlands physiographic region--a portion of the Rocky Mountains which extends across northeastern Washington. The county is predominantly hilly and mountainous with the forest-covered Okanogan Highlands occupying most of the area's landscape. A portion of the Okanogan Highlands known as the Kettle River Range extends the length of Ferry County forming a relatively high divide between the Sanpoil and Columbia Rivers. Elevations reach as high as 7,153 feet on Copper Butte in the northern Kettle River Range. The mountains are composed of complex rocks with numerous small deposits of nonferrous minerals.

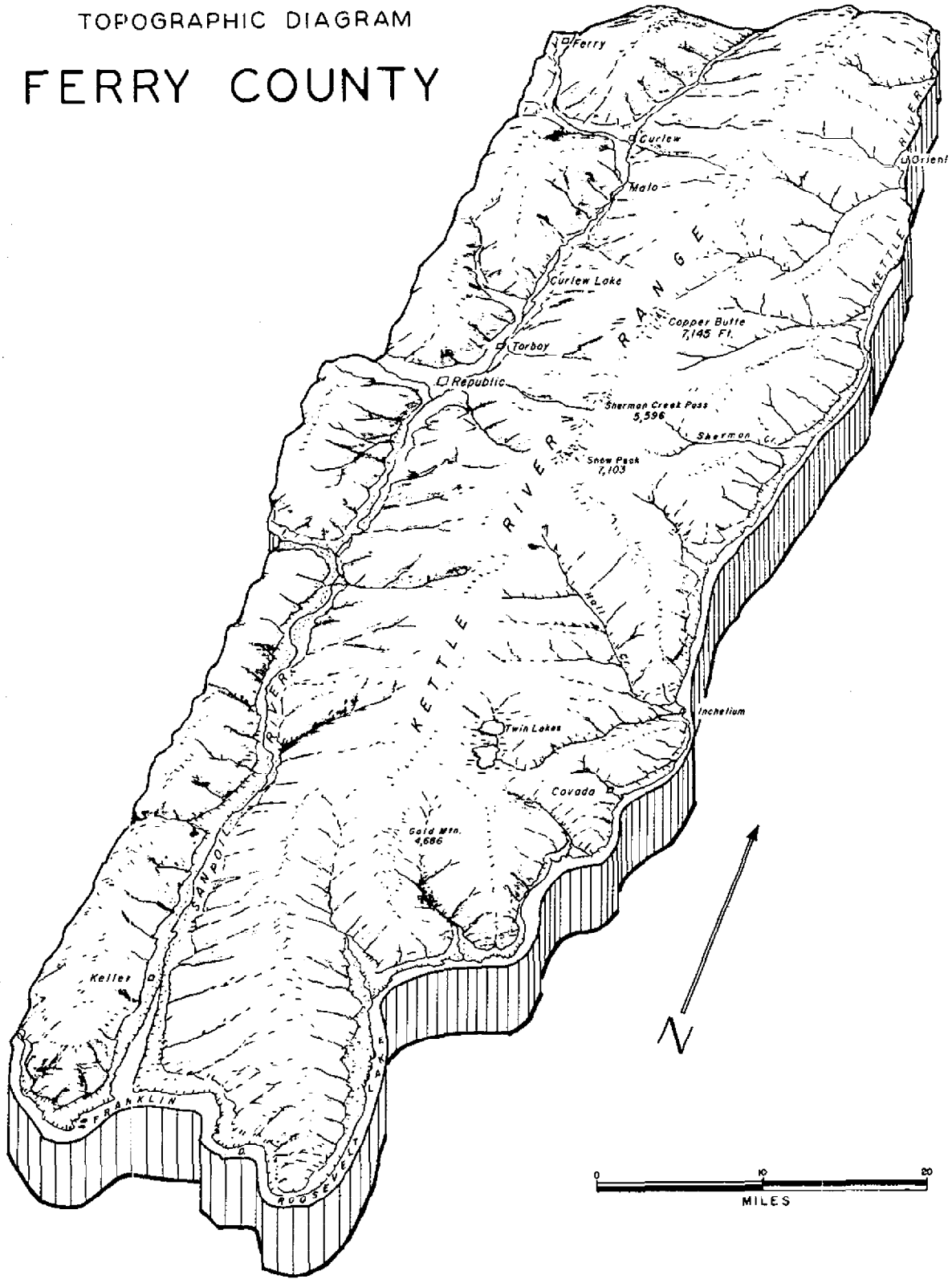
The Columbia, Sanpoil and Kettle Rivers form the main hydrographic features of Ferry County. The Columbia River upstream from Grand Coulee Dam is in the form of a huge reservoir--Franklin D. Roosevelt Lake. Roosevelt Lake defines most of the eastern border of Ferry County as well as all of its southern boundary. The Sanpoil River flows from Curlew Lake located in the northwestern part of the county near Republic southward in western Ferry County to Roosevelt Lake. The Kettle River, which originates in Canada, enters Ferry County at its northwestern corner and flows as far south as Curlew. It then bends into a northeasterly direction back into Canada, continues eastward and finally swings to the south crossing again the international border to form the eastern boundary of Ferry County before it empties into Roosevelt Lake. Kettle River is fed by Curlew Creek flowing northward from Curlew Lake. Most of the alluvial bottomlands and low terraces in Ferry County are limited to the valleys of the above-mentioned rivers. Much of the lower sections of these valleys were flooded by the creation of Roosevelt Lake. Several small creeks run out of Kettle River Range westward into Sanpoil River or in the opposite direction into either Kettle River or Roosevelt Lake.

Ferry County's primary farming areas are found in the upper valleys of the Sanpoil and the Kettle Rivers. Bottomlands around Curlew, where the Curlew Creek and Kettle River join, are also important. Elevations of cropland range from 1,820 to 2,000 feet in the Curlew district. The lower Kettle River area contains some narrow bottom and benchlands 1,290 to 1,400 feet in elevation where crops are


PHYSIOGRAPHIC DIAGRAM
WASHINGTON
PREPARED BY WASHINGTON CROP AND LIVESTOCK REPORTING SERVICE
W. R. Clevinger, Cartographer
0 10 20 30 40 50 MILES
1955
124
122
120
118
49
48
47
46
PACIFIC OCEAN
STRAIT OF JUAN DE FUCA
SAN JUAN ISLANDS
OLYMPIC MOUNTAINS
COASTAL PLAIN
PUGET SOUND
PUGET GLACIAL DRIFT PLAIN
WILLAPA HILLS
WILLAMETTE-PUGET LOWLAND
CASCADE MOUNTAINS
OKANOGAN HIGHLANDS
SELKIRK MOUNTAINS
WATERVILLE PLATEAU
COLUMBIA BASIN
CHANNELLED SCABLANDS
QUINCY BASIN
CENTRAL PLAINS
PALOUSE HILLS
BLUE MOUNTAINS
YAKIMA FOLDED MOUNTAINS
SADDLE MOUNTAINS
HORSE HEAVEN HILLS
Walla Walla Gateway
COLUMBIA R.
GENERALIZED CROSS-SECTION ALONG 47°30'
20,000 FEET
COAST RANGE
CASCADE MOUNTAINS
COLUMBIA BASIN
COASTAL PLAIN
OLYMPIC MOUNTAINS
WILLAMETTE-PUGET LOWLAND
PUGET GLACIAL DRIFT PLAIN
WATERVILLE PLATEAU
CHANNELLED SCABLANDS
PALOUSE HILLS
SEA LEVEL
(VERTICAL SCALE EXAGGERATED 8 TIMES)
1955

TOPOGRAPHIC DIAGRAM

FERRY COUNTY



WASHINGTON CROP AND LIVESTOCK REPORTING SERVICE

W.R. CLEVINGER

grown. Pockets of cropland are also found along Roosevelt Lake in the east-central part of the county. The lower Sanpoil River in the Colville Indian Reservation has lowlands and terraces ranging from 1,290 to 1,600 feet in elevation used for grazing and for some hay and grain. Another small cropland area in the southern part of the county is Nine Mile Creek Valley.

Climate

The climate of any region not only affects the pattern of flora that are native to the area but is a major determinant of what man grows there. Variations in weather may either stimulate or destroy crops in the process of development. For these obvious reasons, the relationship of climate and weather to agriculture is very close.

The climate of Ferry County is a highland, continental type with local variations in temperatures and precipitation related to differences in elevation and exposure. However, some of the characteristics of a marine climate are also observed. The eastward movement of air from the Pacific Ocean is obstructed by the Cascade Mountains, which rise to elevations of 5,000 to 7,000 feet with peaks in excess of 10,000 feet and form a north-south topographic and climatic barrier across the state. Some of the air, however, passes over the summit of this range and has a moderating influence on Ferry County's climate. This also results in considerable cloudiness and some fog during the winter. The Rocky Mountains protect this area of the state from the more severe storms moving out of the Arctic region during the winter. Some of the cold, arctic air manages to reach this area by spilling over the Rocky Mountains or by finding its way through north-south valleys. These outbreaks of cold air usually result in low temperatures. Generally speaking, the climate is characterized by warm days, cool nights, dry air, light precipitation and mostly sunny skies during the summer and rather cold but less severe winters than are experienced at similar latitudes east of the Rocky Mountains.

Temperature records from stations located in the valleys show that the area's average afternoon temperature in the summer is in the middle 80's and the nighttime temperature is in the upper 40's. The maximum temperature exceeds 90 degrees on a few days each summer and occasionally reaches 100 degrees. The average afternoon temperature in the winter ranges from the upper 20's to the lower 30's and the nighttime temperature from 10 to 15 degrees. Minimum temperatures ranging from -10 to -20 degrees are usually recorded on a few nights each winter. Extreme temperatures of 35 degrees below zero have been recorded at Republic.

The growing season in Ferry County is shorter than most parts of Washington. The season generally extends from the last week of May to mid-September, a period of about 120-130 days. These conditions stem from area's relatively high elevations and exposure to colder air masses. Risk of frost and winterkill discourages the planting of vegetables and fruit crops. Most successful in the county are the hardier feed crops.

Most of the precipitation in the county falls in the winter as snow. Snow usually remains on the ground in the valleys from about the first of December until March. The depth of snow on the ground ranges from 10 to 15 inches during the average winter, however, depths ranging from 24 to 32 inches have been recorded at Republic. Snow depth increases rapidly with elevation along the slopes of the mountains and many of the higher elevations become inaccessible. The

Table 4. Temperature Data
Average Maximum, Average Minimum, Mean, Highest and Lowest Temperature Each Month
Ferry County

		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Laurier (1644' elev.) 1931-60	Av. Max.	30.2	37.1	48.3	62.8	72.9	78.2	88.2	86.3	76.4	59.1	40.6	33.0	59.4
	Av. Min.	15.2	18.0	25.5	33.0	40.7	46.6	50.6	48.5	42.0	34.1	26.6	20.8	33.5
	Mean	22.7	27.6	36.9	47.9	56.8	62.4	69.4	67.4	59.2	46.6	33.6	26.9	46.5
	Highest	53	55	72	90	102	103	109	105	104	85	61	56	109
	Lowest	-32	-30	-13	11	16	29	35	33	24	6	-9	-16	-32
Republic (2610' elev.) 1930-59	Av. Max.	29.8	36.7	46.4	58.6	68.1	73.5	83.5	82.6	73.8	58.4	39.9	32.1	57.0
	Av. Min.	13.3	15.3	22.3	29.5	36.1	41.6	44.6	42.4	37.3	30.6	22.2	17.1	29.4
	Mean	21.6	26.0	34.4	44.1	52.1	57.6	64.1	62.5	55.6	44.5	31.1	24.6	43.2
	Highest	50	58	77	86	94	97	107	105	98	87	63	60	107
	Lowest	-33	-35	-19	3	11	25	29	27	18	-5	-15	-20	-35
Inchelium (1685' elev.) 1953-62	Av. Max.	32.4	38.9	48.4	61.0	70.1	77.1	86.6	84.3	75.2	58.4	42.9	36.0	59.3
	Av. Min.	17.0	20.6	24.7	32.1	40.3	45.5	48.3	47.4	40.7	33.3	25.5	21.8	33.1
	Mean	24.7	29.7	36.5	46.5	55.2	61.3	67.4	65.8	57.9	45.8	34.2	28.9	46.2
	Highest	50	59	73	85	93	98	103	105	94	81	62	58	105
	Lowest	-26	-16	-3	20	20	31	31	34	26	19	-1	-9	-26

Source: U. S. Weather Bureau, Climatological Office.

Table 5. Probability of Freezing Temperatures -- Ferry County 1/

STATION	TEMP. (° F.)	PROBABILITY — SPRING					PROBABILITY — FALL					Growing Season Mean Length (Days)
		90%	75%	50%	25%	10%	10%	25%	50%	75%	90%	
Laurier	32	Apr 25	May 7	May 21	Jun 3	Jun 16	Aug 29	Sep 9	Sep 21	Oct 3	Oct 14	123
	28	Apr 5	Apr 17	Apr 30	May 14	May 26	Sep 7	Sep 18	Sep 30	Oct 12	Oct 23	153
	24	Mar 13	May 26	Apr 8	Apr 21	May 3	Oct 1	Oct 12	Oct 24	Nov 5	Nov 16	199
	20	Feb 28	May 12	Mar 26	Apr 8	Apr 20	Oct 14	Oct 25	Nov 6	Nov 18	Nov 29	225
	16	Feb 13	Feb 24	Mar 10	Mar 24	Apr 5	Nov 1	Nov 13	Nov 24	Dec 6	Dec 17	259
Republic	32	May 10	May 22	Jun 4	Jun 17	Jun 29	Aug 20	Sep 1	Sep 12	Sep 24	Oct 5	100
	28	Apr 26	May 8	May 21	Jun 4	Jun 16	Sep 1	Sep 12	Sep 24	Oct 6	Oct 17	126
	24	Mar 30	Apr 12	Apr 25	May 8	May 20	Sep 14	Sep 25	Oct 7	Oct 19	Oct 30	165
	20	Mar 9	Mar 20	Apr 3	Apr 17	Apr 29	Oct 4	Oct 15	Oct 27	Nov 8	Nov 19	207
	16	Feb 26	Mar 10	Mar 23	Apr 6	Apr 18	Oct 11	Oct 22	Nov 3	Nov 15	Nov 26	225

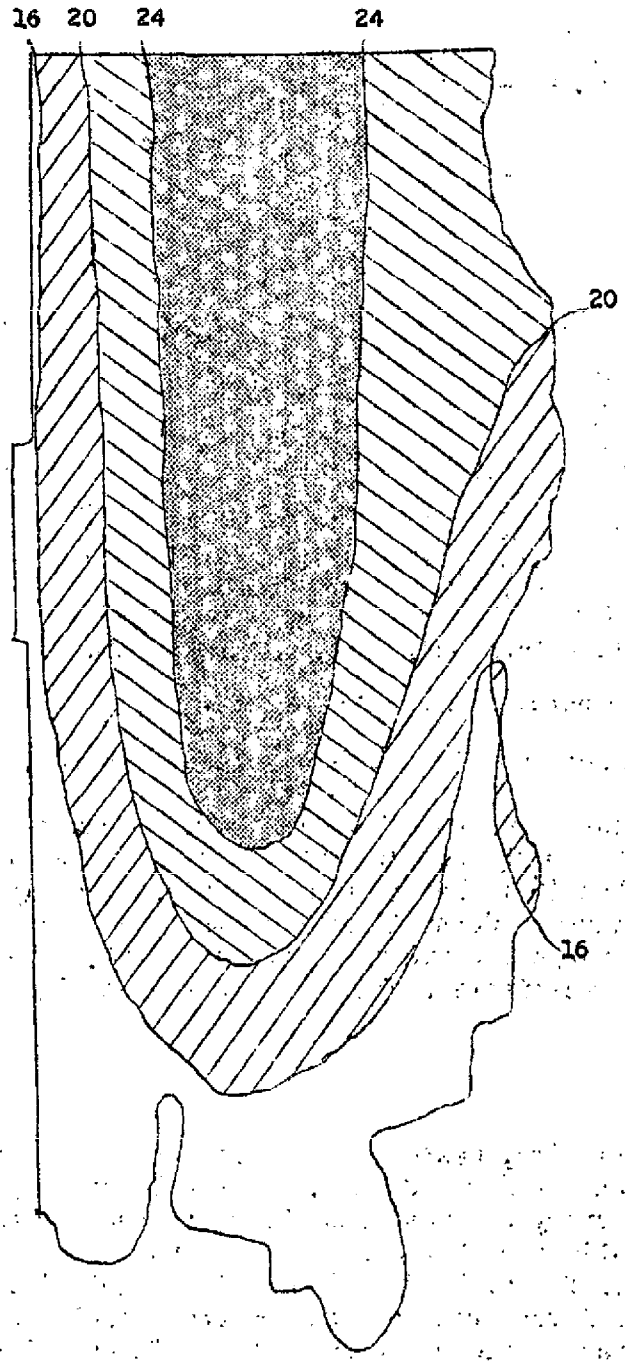
Source: U. S. Weather Bureau, Climatological Office.

1/ To illustrate the data in the table, we find that the 50 percent probability of a 32° spring freeze for Republic is June 4. But there is also a 25 percent chance (1 year in 4) that a 32° freeze will occur as late as June 27, and a 10 percent chance as late as June 29.

Table 6. Precipitation - Ferry County

Station	Elevation (ft.)	Period of Record	Average Annual	Greatest Annual	Least Annual	Greatest Monthly	Least Monthly	Greatest Daily
Laurier	1,644	1931-60	19.26	28.53	12.37	4.65	0	1.55
Republic	2,610	1930-59	14.89	21.74	9.09	5.24	0	3.50
Inchelium	1,685	1954-63	18.0	21.67	12.46	6.66	0	1.99

Source: U. S. Weather Bureau, Climatological Office.



Under 16 inches

16 to 20 inches

20 to 24 inches

Over 24 inches

NOTE: Isolines are drawn through points of approximately equal value. The map is intended to give a general impression of the overall precipitation pattern of the county based on annual means in inches. Caution should be used in interpolating the map when dealing with specific locations since pockets of drier, lowland areas found within the county's mountainous terrain are not shown because of map scale.

Source: U. S. Weather Bureau, Climatological Office.

Figure 3. Distribution of Precipitation
Ferry County

summertime precipitation is frequently associated with thunderstorm activity. Forest fires are often started by lightning in this mountainous area of the State.

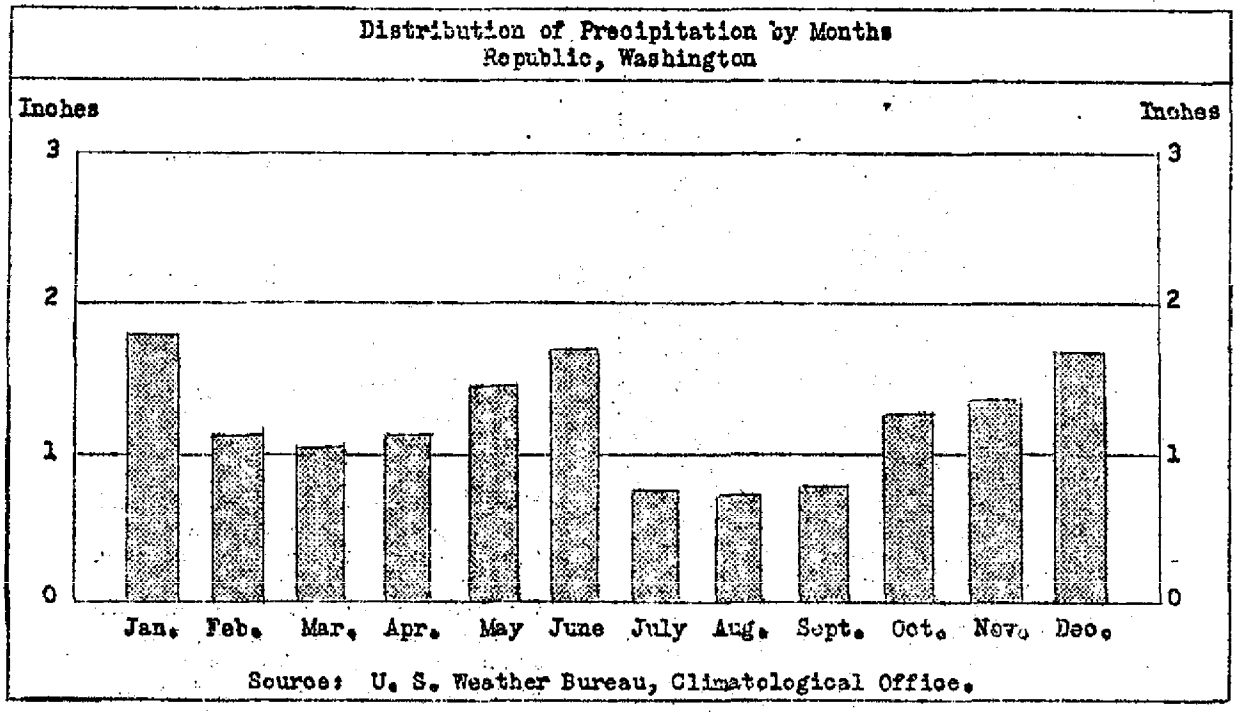


Figure 4. A Graph of the Precipitation at Republic, Washington.

Locally, the amount of precipitation which falls on a given location depends largely on its elevation and exposure to the area's prevailing air masses. The driest area of Ferry County--less than 16 inches of precipitation annually--is found in the southern part of the county. Central and north-central portions of the county occupied by Kettle River Range receive the largest amount. The remaining portions of the county receive precipitation which averages 16 to 24 inches annually.

Forest and Wildlife

A coniferous forest of ponderosa pine, western larch and Douglas fir covers nearly all of the mountainous sections of Ferry County. On the lower slopes, the forest is mainly open with an under-story of grass and shrubs suited for grazing. In 1960, the U. S. Forest Service estimated that about 84 percent of the county land area, or 1,186,000 acres, was in forest lands. About 80 percent of the county area, or 1,123,000 acres, was inventoried as growing commercial forests; another 4.4 percent, 63,000 acres, was considered noncommercial forest of subalpine trees and steep and rocky woodlands. 1/

In 1960, public ownership of commercial forest lands totaled 979,000 acres in Ferry County, of which nearly 39 percent was in the Colville National Forest. The remaining 144,000 acres of commercial forest lands in the county was owned by farmers and other private individuals or concerns. In 1960, there was an estimate

1/ U. S. Forest Service, Pacific Northwest Forest and Range Experiment Station, Portland, Oregon. "Forest Statistics for N. E. Washington." May, 1963.

reserve of live sawtimber containing 7,236,000,000 board feet in the county.

Ferry County agriculture benefits in a number of ways from forest resources. Logging and lumber industry provides seasonal employment or part-time work for many farmers who depend on off-farm payrolls. The U. S. Forest Service also provides some seasonal work in Colville National Forest. Local livestockmen utilize grazing permits allowed in the national forest. Forested areas form important watersheds necessary for irrigation of lands in the upper Kettle and Sanpoil Valleys. Finally, forest lands provide recreation, hunting and fishing for farmers as well as some income from packing and provisioning services for tourists and sportsmen.

Ferry is one of the leading counties in eastern Washington in regards to the annual harvest of timber. In 1961, the timber harvest from all ownerships for the county was estimated at 103,899,000 board feet from 17,342 acres 1/. Over 88 percent of the timber harvest was taken from Indian and U. S. Forest Service lands. The remaining portion of the harvest came from state, private and Bureau of Land Management owned lands. A large amount of timber and other forest products have come from the farmlands. In 1959, 50 farms in Ferry County reported sales of forest products amounting to $249,788. About 47 percent or $117,671 of the total farm sales represented standing timber.

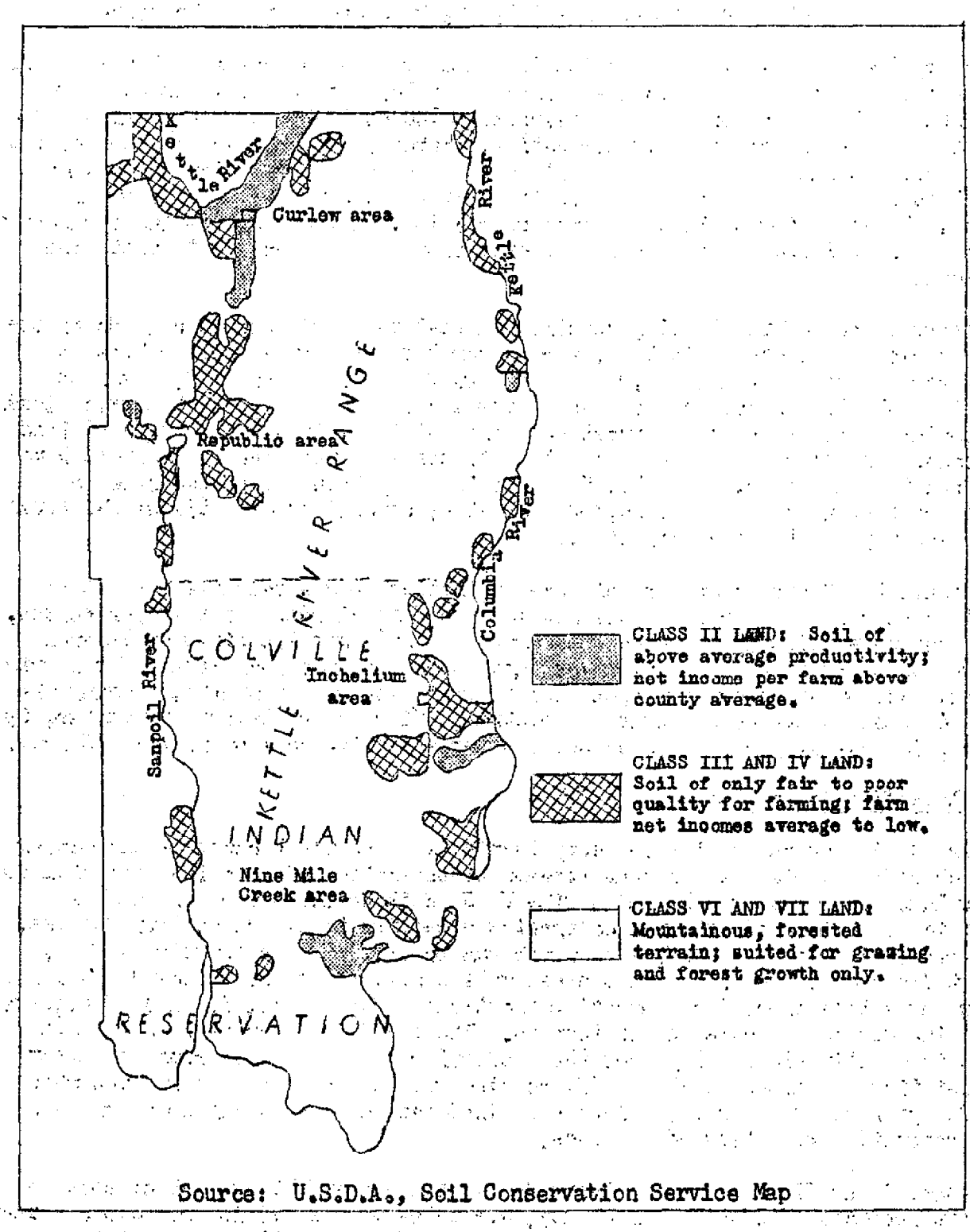
Washington State Department of Game statistics show a valuable harvest of animal resources from forests, streams, lakes and farmlands. In the 1962 season, 1,550 deer were killed. The pheasant harvest in 1962 was 790 birds while ducks numbered 500. There are several rivers and lakes open the year around for sports fishing. All other waters are open except during the winter months. During the 1962-1963 season, trappers caught 382 muskrat, 252 mink, 42 bobcat, 23 marten, 23 raccoon, 10 weasel, 5 coyote, 4 skunk, 2 otter and 1 Canada lynx in Ferry County.

Land Classification and Soils

The soil characteristics in Ferry County vary greatly because of the manner in which older glaciers and recent streams transplanted and deposited material in the lowlands and drainage channels. The U. S. Soil Conservation Service has classified land into eight broad categories according to its capability for use. The first four classes include land which can be plowed and cultivated safely, without lasting damage, if correct conservation procedures are followed. Class I land needs little special conservation treatment. Classes II, III and IV require increasing degrees of care and protection. The remaining four classes are not suited for cultivation. They need the protection afforded by a permanent cover of vegetation. Classes V, VI and VII require progressively more care even when used for grazing or forestry. Class VIII land can be used safely only for wildlife, recreation or watershed purposes.

There is no Class I land in Ferry County but Class II lands, which contain the most productive soils in the county, are relatively small in area and are very localized in Ferry County. These lands consist of river bottom clay, silty and sandy loams. The Kettle River and Curlew Creek lowlands around the settlement of Curlew form the largest single area of Class II land in the county. Class II

1/ State of Washington, Department of Natural Resources.



Source: U.S.D.A., Soil Conservation Service Map

Figure 5. General Quality of Land in Ferry County

lands are also found near the mouth of Nine Mile Creek in southern Ferry County and in the east-central Inchelium district.

Class III and IV lands of rolling and hilly foothill terrain and benchlands of thinner, coarser and drier soils are found scattered in many creek valleys and lake districts. Lands of these two classes are most numerous along Roosevelt Lake in the eastern part of the county. They are also found in various locations in the Sanpoil River, Kettle River and Curlew Creek Valleys.

Class VI and VII lands--areas considered not suited for cultivation--cover most of Ferry County. These lands are best suited for grazing and forestry use. The major hazards or limitations of Class VI and VII lands are very steep slopes, shallow or droughty soils or susceptibility to erosion.

Table 7. Number of Farms, Land in Farms and Value of Livestock and Crops Sold Off Farms, Washington Counties - 1959

County	Number of Farms	All Land in Farms (acres)	Value of all Crops Sold Off Farms (dollars)	Value of all Livestock and their Products Sold Off Farms (dollars)
Adams	786	1,076,960	21,055,532	3,547,300
Asotin	325	364,405	2,589,582	1,179,464
Benton	1,281	562,809	12,912,165	3,958,996
Chelan	1,636	215,646	16,877,563	660,083
Clallam	724	68,739	706,055	2,858,512
Clark	2,778	188,479	3,020,725	8,222,499
Columbia	333	359,134	9,778,027	1,148,786
Cowlitz	1,014	80,176	1,022,291	2,808,884
Douglas	935	1,012,561	12,985,276	1,067,743
FERRY	283	298,247	396,384	931,057
Franklin	742	590,027	10,305,160	3,596,711
Garfield	274	344,994	6,871,789	898,109
Grant	1,497	1,075,642	26,083,038	12,555,694
Grays Harbor	896	99,529	924,067	2,639,777
Island	493	38,702	515,863	1,909,572
Jefferson	266	35,123	212,568	758,107
King	2,952	114,719	6,240,212	14,298,190
Kitsap	906	29,776	437,819	1,374,547
Kittitas	905	580,035	2,961,833	10,945,370
Klickitat	741	960,614	3,859,102	3,083,797
Lewis	2,230	255,012	1,893,636	7,935,581
Lincoln	959	1,422,981	21,035,259	3,253,383
Mason	328	35,518	202,594	728,250
Okanogan	1,762	2,048,406	10,681,584	5,723,537
Pacific	499	53,348	819,224	1,086,617
Pend Oreille	366	124,239	265,001	1,222,488
Pierce	2,535	153,363	4,928,685	10,850,000
San Juan	209	45,707	91,694	595,403
Skagit	1,740	141,770	6,722,958	9,167,984
Skamania	177	20,177	283,595	259,736
Snohomish	2,919	148,604	2,788,695	12,899,240
Spokane	2,990	822,008	15,091,158	8,403,816
Stevens	1,608	803,776	3,836,457	5,676,015
Thurston	1,220	142,170	1,952,408	5,836,930
Wahkiakum	302	26,299	174,415	1,052,642
Walla Walla	981	822,729	19,957,499	4,228,801
Whatcom	3,151	185,045	3,943,630	17,706,625
Whitman	1,824	1,485,709	43,632,434	7,398,484
Yakima	6,010	1,884,694	75,760,207	32,919,536
State Total	51,577	18,716,972	353,816,184	215,388,266

Source: U. S. Census of Agriculture, 1959.